

Adapt

On-farm changes in the face of climate change

Top Five Crops to Watch

Strawberries

Lettuce

Carrots

Avocados

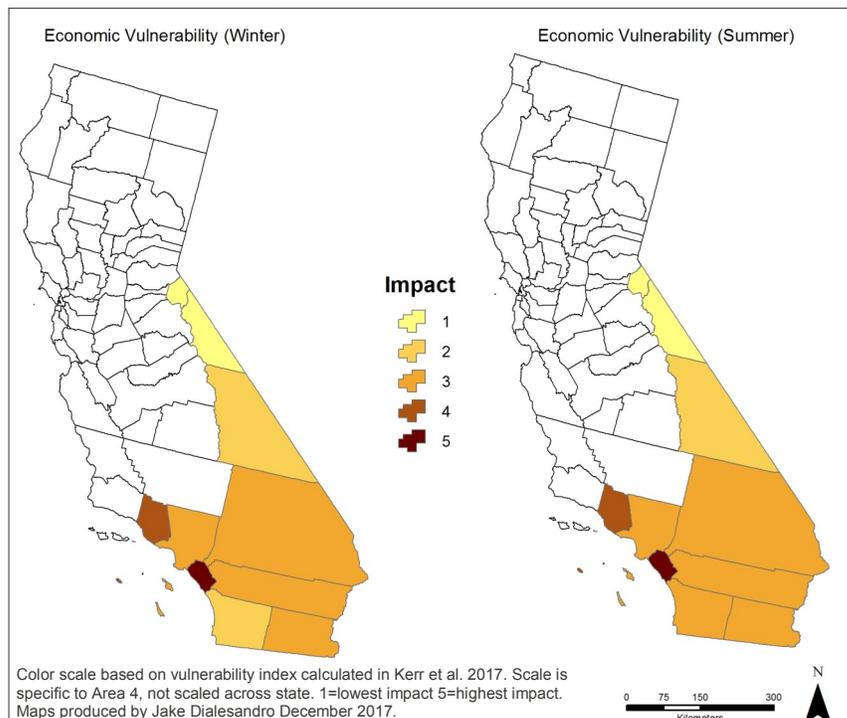
Table Grapes

More Heatwaves and Less Chill for California

The agricultural economy of certain counties in California are more vulnerable to projected changes in climate than others; this flyer details on-farm adaptation strategies to mitigate some of the effects of increased winter temperatures and frequency of summer heatwaves.

Projected conditions put the most strain on heat intolerant crops and crops with high chill requirements. Crops with these characteristics that also have a high market value or are grown in large acreage, make a county vulnerable to economic declines. Information on this flyer highlights the most vulnerable counties in California Area 4 and crops which are causing this.

For more detailed advice, please reach out to the UC Cooperative Extension Specialists listed to the left.



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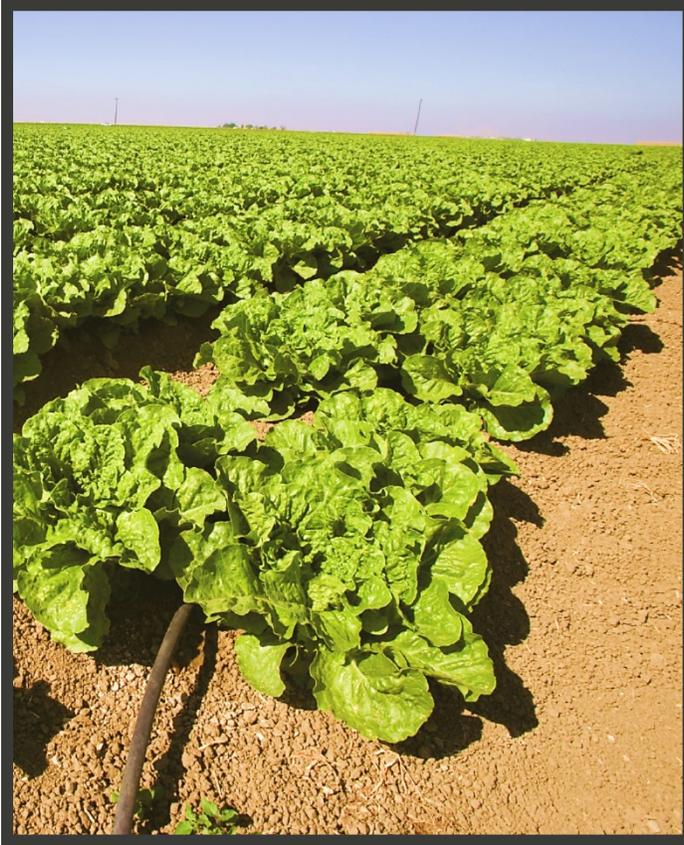
Viticulture

Mark Battany, mcbatany@ucanr.edu

Kerr et al., "Vulnerability of California specialty crops to projected mid-century temperature changes". 2017.

Strawberries

cause economic vulnerability in Orange and Ventura counties because of their high value, acreage, and extreme climate sensitivity. Warmer temperatures may shorten growth cycle, promote pest and disease pressure, and reduce pollination. Using ventilated protective structures to provide shade and syncing irrigation frequency and amount with evaporative demand are currently the best on-farm methods for mitigating heat stress. Strawberry production would benefit from a move to cooler zones.



Lettuce is economically vulnerable crops because of its sensitivity to warm temperatures. Ideal growing temperatures are around 73°F (daytime) and 45°F (nighttime). Warmer spring and summer temperatures cause bolting, while temperatures above 90°F cause bitterness. The most vulnerable counties to economic losses from lettuce are Imperial, Riverside, and Ventura. Planting and harvesting earlier may avoid heat stress. Changing to heat tolerant and bolt-resistant varieties may also mitigate climate risks.

Carrot production causes the most economic vulnerability in Kern and Imperial counties based on climate projections. Although temperature increases in both summer and winter will effect this crop, carrots are most sensitive to projected summer maximum increases. Temperatures above 86°F can cause unpleasant flavors, while heat stress during carbohydrate accumulation causes loss of color, decreasing value. Carrots are also susceptible to increased disease and weed pressure with warmer weather. Planting dates can be adjusted to avoid heat.

Avocados cause economic vulnerability in San Diego and Ventura due to projected increases in summer temperatures. Avocados are extremely sensitive to drought conditions and salinity, both of which may be exacerbated with increased evaporative demand. About 93% of the nation's avocados are grown in California, but it is projected that by 2060 there will be a 45% reduction in California yields without adaptation. Unfortunately, there may be little room for genetic breeding programs. However, if water issues can be kept at bay, the lower chance of freezes and lack of significant pest pressure may benefit avocado production.

Table Grapes are sensitive to temperature increases due to cosmetic appearance and have the highest potential for economic loss in Kern County because of projected summer and winter temperature increases. On-farm adaptation includes transitioning to varieties with greater heat tolerance, canopy misting, irrigation tactics, trellising type, canopy management, partial shading, reflective material spray, and taller vine training height.